

## Technical Recommendations for the Residents of 644/652 Carter Road.

### **Situation – July 2012**

The groundwater produced by the well that services the mobile homes located at **Ex. 6 - Personal Privacy** contains high levels of methane, manganese and iron. Currently, there are individual water treatment systems in-place at each residence, designed to treat the groundwater for taste and odor. The taste and odor problem is in all likelihood related to high levels of iron and manganese. Field tests conducted by EPA during the latest sampling event seem to indicate that this type of system; chlorination and charcoal filtration, when operated correctly will adequately remove iron and manganese to levels where the water no longer exhibits taste and odor problems.

Importantly, EPA analysis indicated that the system at **Ex. 6 - Personal Privacy** did not reduce the level of manganese from the groundwater. Based on the measurements taken during the groundwater sampling and operation of the water treatment systems, it was calculated that the system located at **Ex. 6 - Personal Privacy** injected considerably less sodium hypochlorite mixture into the groundwater during the treatment process than the system operating at **Ex. 6 - Personal Privacy**. This could be an explanation as to why this system did not reduce the level of manganese.

### **Summary**

The water treatment systems currently in operation at the residences of **Ex. 6 - Personal Privacy** employ the most basic equipment and elementary techniques. As such, they rely on the owner's maintenance to assure proper operation. Further, as shown by the latest analysis, the system at **Ex. 6 - Personal Privacy** requires adjustment and retesting to assure that an adequate amount of sodium hypochlorite is being injected to groundwater as it undergoes treatment. For proper operation, these treatment systems are completely dependent upon the residents to assure an adequate volume of sodium hypochlorite at the proper concentration is present in the system reservoir and available for injection into the treatment stream.

In addition to reduction of manganese, there are other groundwater issues present at the well. Those are the potential production of chloroform and the presence of methane.

#### Production of Chloroform

Chloroform, a trihalomethane, may be an unwanted by-product of the chlorination of groundwater saturated with methane.

Chloroform may occur through drinking water, where chloroform is formed as a result of the chlorination of naturally occurring organic materials found in raw water supplies. EPA has classified chloroform as a Group B2, probable human carcinogen.<sup>i</sup>

EPA strongly recommends that the residents test their treated groundwater for chloroform before using the water for drinking.

## Methane in Groundwater

As noted above, high levels of methane were observed in the groundwater produced by the well servicing the residences at Ex. 6 - Personal Privacy. Field tests indicate the methane concentration in groundwater is greater than the saturation level of 28 milligrams per liter. Methane at this level may present both a fire and explosion threat, as well as complicating the treatment process by potentially contributing to the creation of trihalomethanes.

EPA strongly recommends that a methane removal system be incorporated in the groundwater treatment system.

The groundwater produced from the well that services the two trailers has historically shown sporadic high levels of methane and manganese. Some of the highest levels of methane and manganese were observed in the latest sampling conducted by EPA. Because of this history EPA recommends regular sampling of the groundwater and assessment of the treatment system performance. This assessment should be conducted at least twice a year. This assessment would further ensure that the carbon in the treatment is not exhausted.

### **Recommendations**

- For efficiency consider the installation of one larger more automated system for both residents.
- Add a methane removal system to the groundwater treatment system.
- Conduct sampling of groundwater produced by the well and treated water twice a year at a minimum for methane, manganese and trihalomethanes.
- Have a professional water treatment technician perform routine maintenance on the treatment system at least once a year or more often if concentrations of contaminants increase.
- Add an additional carbon cylinder to the treatment system to assure the groundwater is being adequately treated in case the carbon becomes prematurely overloaded. The additional cylinder should be installed in series with a sampling port between the two carbon cylinders. When the primary cylinder is exhausted, the second cylinder can be moved to the primary position and a new cylinder can be placed at the secondary position.

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<sup>i</sup> Chloroform EPA website <http://www.epa.gov/ttn/atw/hlthef/chlorofo.html> downloaded July 21, 2012